

DOCUMENT RESUME

ED 327 334

PS 019 376

AUTHOR Swensson, Marjorie
TITLE Nutrition and Its Effects on Learning.
PUB DATE Nov 90
NOTE 43p.; M.S. Practicum, Nova University.
PUB TYPE Dissertations/Theses - Practicum Papers (043)

EDRS PRICE MF01 Plus Postage. PC Not Available from EDRS.
DESCRIPTORS Behavior Problems; *Eating Habits; *Elementary School Students; Grade 4; Grade 5; High Risk Students; Intermediate Grades; Learning Problems; *Nutrition Instruction; *Parent Participation; *Student Improvement

ABSTRACT

A 12-week practicum intervention, designed to improve the classroom performance of 17 elementary school students experiencing learning or behavior problems by offering the students nutrition instruction and improving nutritional practices in the students' homes, was implemented and evaluated. Students were required to agree to: (1) eat a nutritious breakfast each morning; (2) limit sugar intake; (3) eat nutritious snacks; (4) eat more fruits, vegetables, whole-grain and protein-rich foods than previously; and (5) attend nutrition education classes two or three times a week. Parents were encouraged to participate in the project. Nutrition classes provided discussions of films on nutrition topics, tasting parties, cooking experiences, parent education sessions, and instruction on reading labels. Effectiveness of the intervention was evaluated by observations of classroom behavior and pre- and posttesting with the Wide Range Achievement Test (WRAT) and a General Nutrition Quiz. Classroom observations revealed that 50 percent of the students had improved in behavior and were enjoying increased academic success. Most children who altered their eating habits scored higher on the posttest WRAT than those who had not. All participants learned the value of proper nutrition. (RH)

* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *

ED327334

PS 019376

U.S. DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement
EDUCATIONAL RESOURCES INFORMATION
CENTER (ERIC)

☐ This document has been reproduced as
received from the person or organization
originating it.

☒ Minor changes have been made to improve
reproduction quality.

• Points of view or opinions stated in this docu-
ment do not necessarily represent official
OERI position or policy.

NUTRITION AND ITS EFFECTS
ON LEARNING

by

Marjorie Swensson

"PERMISSION TO REPRODUCE THIS
MATERIAL IN MICROFICHE ONLY
HAS BEEN GRANTED BY

Marjorie
Swensson

TO THE EDUCATIONAL RESOURCES
INFORMATION CENTER (ERIC)."

A Practicum Report

submitted to the Faculty of the Center for the Advancement
of Education at Nova University in partial fulfillment of
the requirements for the degree of Master of Science.

The abstract of this report may be placed in a National
Database System for reference.

November/1990

Authorship Statement

I hereby testify that this paper and the work it reports are entirely my own. Where it has been necessary to draw from the work of others, published or unpublished, I have acknowledged such work in accordance with accepted scholarly and editorial practice. I give this testimony freely, out of respect for the scholarship of other workers in the field and in the hope that my own work, presented here, will earn similar respect.

Signed Margaret Swenson

Abstract

Nutrition and its Effects on Learning.

Swensson, Marjorie R., 1990: Practicum Report, Nova University, The Center for the Advancement of Education.
Descriptors: Nutrition/Eating Habits/Health Education/Young Children/Breakfast Programs/Nutrition Instruction/Parent Role/Prevention/Sugar/Food/Learning Problems/Academic Achievement/

This practicum describes a plan for improving the nutritional practices of children to show its benefits on success in school. A target group of seventeen students experiencing learning and/or behavior problems with no apparent learning disability was used in this study. Parents had to agree to alter the eating habits of the child in order to be included in the special nutrition and cooking classes that were conducted by the author. Parents were also educated and involved. The writer measured success by comparing the pretest and posttest scores of the children who did change eating habits with the scores of the students who did not alter eating practices. General Nutrition Quiz scores were evaluated along with Wide Range Achievement Test scores.

Table of Contents

	Page
Title Page	i
Authorship Statement	ii
Abstract	iii
Observer's Verification	iv
Table of Contents	v
Chapters	
I. Purpose	1
II. Research and Solution Strategy	9
III. Method	15
IV. Results	27
V. Recommendations	30
Reference List	32
Appendices	
Appendix A: Observation of Student Behaviors	35
Appendix B: Nutrition Report	37
Appendix C: General Nutrition Quiz Pre/Posttest	39
Appendix D: Letter to Parents	41

CHAPTER I

PURPOSE

The setting for this practicum was an elementary school located in an urban area with 27 municipalities and townships. The population was about 1.9 million and consisted of three major ethnic groups: 41 percent Hispanic; 27 percent Black non-Hispanic; 31 percent non-Hispanic White; and one percent other.

The elementary school that was used for this practicum consisted of two major ethnic groups. The Hispanic group, mostly of Cuban origin, made up about 82 percent of the population. The White non-Hispanic group made up about 17 percent of the population. The Black non-Hispanic and others made up about one percent of the population.

The enrollment of the elementary school as of September, 1990 was 742 students in grades K-5. The class size was comprised of approximately 29 students in grades K-3 and 35 students in grades 4-5.

The administrative staff consisted of one principal and one assistant principal. The teaching staff was composed of 25 classroom teachers, three exceptional student teachers, one guidance counselor, one media-specialist and four teacher aids. Specialist teachers also included one art teacher,

four Spanish teachers, one music teacher, one speech therapist and two physical education teachers. Forty percent of the teachers in this school had masters' degrees or higher and the average teaching experience was 17 years.

The neighborhood around the school was in a lower socio-economic area. There were single family homes, duplexes and several multi-story apartment buildings. Approximately 20 percent of the parents were college educated and 30 percent of the family bread winners were employed in white collar occupations. Approximately 25 percent of the children lived in single parent families and 50 percent of the children needed before and/or after school care. Approximately 26 percent of the children were getting free or reduced-price lunches.

The Report of School Progress (Bucholtz, 1989) listed four school goals for the 1989-1990 school year.

- 1) To improve academic performance of students in basic skills.
- 2) To improve the number of students eligible to participate in the gifted and talented programs.
- 3) To improve student attendance and reduce drop-out rates of all students.
- 4) To improve the critical and creative thinking skills of all students.

The Parent-Teacher Association sponsored many activities during the year to raise funds for enhancing the school programs. Last year these funds were used to purchase risers and musical instruments for the music department, computers and printers for the computer lab, televisions for the portable classrooms and additional physical education equipment. The Parent-Teacher Association also sponsored the Spanish Club, the Student Council, the School Chorus, the Safety Patrol, the Spelling Bee, Cultural Arts Day, the School Store and Family Fun Day.

The writer has been a classroom teacher for 23 years. Twenty of the years were spent as a first grade teacher. One year was spent as a sixth grade teacher, another as a second grade teacher and one as a kindergarten teacher. Three years were spent teaching overseas on American military bases. This writer has spent nine years teaching one of the four first grades at the above-described elementary school.

This writer has spent several years observing and comparing the eating habits of those who do well in school with those who do not do well in school.

The saying, "You are what you eat", has been heard for many years. Why, then, is the concept of eating nutritionally sound diets not put into practice more, especially among pre-school and school-aged children?

Many pregnant women are taught the importance of proper pre-natal nutrition in order to deliver a healthy, normal baby. After birth, however, the same parents tend to let adequate nutrition of their child, or children fall by the wayside. Too much sugar is allowed and not enough healthy foods are encouraged. This is largely due to misleading advertising in which junk food is encouraged and poor eating habits are glamorized.

Adequate nutrition for children during the early years has been known to be essential for good health and proper growth. Why then isn't proper nutrition considered necessary, by parents, for good behavior and the ability to learn?

Some of the most important things that brains do are think, create and learn. From the brain comes personality, intelligence, moods, imagination, desires and all activities such as walking, eating, crying and laughing (Kiestner, 1982). For a long time it has been known that nutrient deficiencies or low blood glucose levels impair the brain's function in general, including its ability to remember and think. Lately, some specific connections are appearing between eating and remembering (Krassner, 1986).

The idea that hyperactivity in children might be caused by the way children eat became popular in 1973, with Dr.

Benjamin Feingold. Since that time many experiments have been completed on pre-school and school-aged children on the effects of diet on learning.

Since nutritional research first began, hyperactivity has been produced in animals lacking any one of a number of nutrients necessary for the normal functioning of the nervous system (Davis, 1972). Some authorities believe that in many cases food additives, caffeine, white flours, sugar and other processed foods may contribute to or cause some of the learning disabilities and behavioral disorders so frequent in today's schools (Charlton-Seifert, Stratton and Williams, 1980; Clark, 1982; Pertz and Putnam, 1982; Norwood, 1984; Rapp, 1986).

In 1986 Rapp learned that in 1950 there was one hyperactive child in every class. Now, five or six are inattentive and disruptive. This writer believes that there are far too many children having learning problems. Sometimes the learning problem stems from a behavior problem. Too many children are called "hyperactive". They wiggle, squirm and fidget, fight, throw temper tantrums and are too easily distracted. Some of these same children cannot concentrate, have no attention span and are forgetful.

A group of children, in a self-contained class, who were experiencing learning and/or behavior problems was used in

this practicum. These 17 children had no apparent learning disability or intellectual impairment. The attendance of these students was poor, averaging sixteen absences each, the previous year. Grades on report cards were low and/or failing and each child in this class had been referred to the Child Study Team because of lack of effort and/or behavior.

It was very necessary to educate the parents of these children on the importance of food power and how diet can affect both learning and behavior. Because these children were experiencing difficulty in school and it was not necessarily caused by low I.Q., the parents agreed to try three things: 1) Reduce or remove all sugar products, 2) Implement the eating of a nutritious breakfast and 3) Increase the amount of fresh fruits and vegetables, whole grains and protein-rich foods.

Since nutrition is the process by which food and other substances fuel the human body, children who are malnourished may not be able to attend or learn as well as well-nourished children.

This project focused on positive changes in nutritional practices in the home and the positive effect in closing the gap between a child's true capacity and his day-to-day performance.

Several studies have shown that parents can accept a nutritional change if an effort is made to educate the parents and children at the same time (Boehnlein, 1984). Parents are the most influential factors in the child's eating habits and need to be convinced that adequate nutrition has a profound effect on learning, behavior and optimum health.

Over a period of three months, while sharing with parents the importance of good nutrition and nutritional needs, 50 percent of the children included in this study will improve their school behavior and/or academic success as charted on a graph of observed behaviors (Appendix A:35).

At the end of this project one-half of the families involved will practice more nutritious eating as shown on the weekly nutrition report (Appendix B:37).

After 90 days all of the children included in this study will have learned the value of proper nutrition as gauged by the difference between pretest and posttest scores on the General Nutrition Quiz (Appendix C:39). Special nutrition education programs will be held after school that will include tasting parties, cooking classes and lessons on how to choose nutritious snacks and prepare easy, nourishing lunches and breakfasts.

At the beginning of the school year a letter (Appendix D:41) was sent home, to those parents of the children in the previously described class, explaining this project and asking if they would care to be included in this study. Only those children whose parents agreed to alter the eating habits of the children were used in this project.

Each Friday, the parents were asked to provide this writer with a pre-printed checklist (Appendix B:37) indicating what their child ate during the week.

The teacher of these students was asked to observe several behaviors and academic successes and rate them on a pre-printed checklist (Appendix A:35).

All of the children in this group were given the Wide Range Achievement Test (WRAT) at the outset of this study. The WRAT was given again at the conclusion, and the scores of those children who did not alter their eating habits were compared to the scores of the children who did change their eating habits.

RESEARCH AND SOLUTION STRATEGY

Since the effects of proper nutrition correlate with so many parts of life - growth, health, energy and well-being - isn't it also probable that proper nutrition correlates with learning and behavior?

Many people think so, as there have been many studies accomplished on this subject. Some show that improved nutritional practices will raise the I.Q., some find that behavior improves, and attention spans are longer, some find that the energy level is raised, and still others show that a greater gain in reading scores is associated with better nutrition. In another study attendance improved due to enriched general health.

Lane and Johnson (1981) found that children who were malnourished were not able to attend or learn as well as well-nourished children. Iron deficiency and iron deficiency anemia were found in as many as 35 percent of the children in lower socioeconomic groups. Children with differing degrees of iron deficiency in low-income families in Guatemala were examined in a double-blind, randomized study (Lozoff et al. 1982). For anemic children, iron status correlated highly with Barley mental test scores. Iron sufficient children had a Barley MDI (Mental Development Index) of 120.7; iron deficient

children had an MDI of 82. In another experiment of iron deficient children (Honig et al. 1983) it was found, and reported, that young children made significant improvements in mental developmental scores within a seven to ten day time period, after iron therapy.

In a study by Walker III, M.D., a neuropsychiatrist from California, it was found that 44 of 48 children with learning disability, depression, temper tantrums or poor concentration had a blood sugar disorder (Prevention 1982). Dr. Walker found that once these children were put on a sugar-free diet rich in vegetables, fruit and high-protein foods, almost all of them had improved behavior.

Research has shown that children who eat adequate breakfasts are quicker in actions and learn more during late morning hours (Pertz and Putnam, 1982; Norwood, 1984).

Stein, Foucar-Szock, and Kauffman (1984) conducted a four month study to examine the effects of improved breakfast nutrition on reading achievement. The experimental group's daily breakfast menu provided variety, high-density carbohydrates, and protein, while the control group received fruit or juice, milk, and packaged cereal. The experimental group showed a seven month gain in reading scores compared with a 5.25 month gain for the control group.

Boehnlein (1984) had excellent results in developing improved eating habits when the parents were educated and involved with the children in nutrition education. Parents were encouraged to share healthy recipes and were invited to tasting parties. It was concluded that involving the parents in a nutrition education program convinced them of the importance of adequate nutrition and contributed to the development of healthier eating.

In another study by Pertz and Putnam (1982) it was shown that there is a direct relationship between diet and learning. Iron-deficient diets produced children who were less able to learn, had lower intelligence quotients and were poorer in language development than those children on iron-sufficient diets. This study also showed that an indirect link to learning was the effect of poor nutrition on absenteeism.

Pereira (1979) studied 79 children aged six to twelve in India who were malnourished in early childhood. They were compared with 102 normal children. The malnourished children performed significantly less well on a test involving matching skills, than the children who were well-nourished. The general school performance of these same children was also inferior, and a two-year follow up study showed no relative improvement with age.

A report by Prinz, Roberts and Hartman (1989) suggested that there was a positive correlation between sugar consumption and destructive-aggressive behavior in four to seven year old hyperkinetic children.

A study at the University of South Carolina (Milius, 1983) examined the relationship of sugar consumption to behavior in hyperactive and normal children. The project involved 28 hyperactive children and 26 control children between the ages of three and eight. The normal children were found to consume significantly more food in general than the hyperactive children.

Rapp (1986) wrote a book concerned with the possible role of foods on behavior and learning problems in children. Rapp learned that in 1950 there was one hyperactive child in every class; now five or six are disruptive, inattentive and easily distracted.

Reed (1983), a former probation officer, did a study on delinquent children and found that these children markedly improved behavior after improving diets. At the beginning of this study it was discovered that these children on probation tended not to eat breakfast. These same children ate more sugar and less fruit, vegetables and protein-rich foods than the average child.

Schauss (1980) reported several studies which indicate that delinquency and vandalism has diminished, in schools, while scholastic ability has increased, when school lunch programs and home diets are made more nutritious.

Goldman (1986) studied sugar and its behavioral effects on children. Those children who had sugar drinks showed a definite decline in performance, compared with those on a placebo drink. Those same children made about twice as many errors after the sugar drink than after the placebo drink.

A recent experiment by Benton (1988) showed a rise in non-verbal I.Q. for children given a daily multivitamin and mineral supplement. A group of 90 children were given an intelligence test and then assigned to one of three groups. One group received a placebo, another group received no special treatment and the third group received a standard multivitamin and mineral supplement. At the end of the year these children were given another I.Q. test. To the surprise of the researchers, who expected to find no differences, the supplemented group showed a significant rise in non-verbal I.Q.

The strategies chosen for this study were selected because the lack of parental knowledge in the area of nutrition is of extreme concern to this author. Students' knowledge regarding

the basics of eating nutritious foods in order to grow, stay healthy, possess energy and learn is another great concern.

Children who are having difficulties in school will be encouraged to participate in this study if they agree to the following plan:

1. eat a nutritious breakfast each morning
2. limit sugar products
3. eat nutritious snacks
4. eat more fruits, vegetables, whole-grain and protein-rich foods
5. attend nutrition education classes two or three times per week

Following the research of Boehnlein, parents will be asked to participate in this project. These parents must agree to follow the above outline and will be encouraged to become involved in the nutrition education classes.

After doing much research it is clear that there is increasing recognition among physicians, nutritionists, and educators, who are trying to cope with hyperactive and learning disabled children, that nutritional status plays an important role. Some of these problems that these children endure may well be related to the foods they do, or do not eat.

CHAPTER III

METHOD

During the first week of school, this writer observed the students in the self-contained class of children who were considered to be "at risk". These pupils all had learning problems and/or behavior problems as well as poor attendance. All of the students had been referred to the Child Study Team and were found to have no learning disability or intellectual impairment. These 17 children were grouped together under the guidance of a masterful teacher. A great part of each day was spent on group discussions after each outburst or explosion of temper. Guidance and peer counseling were the major concerns. This class was composed of boys and girls in grades four and five. The teacher of this class expressed that the parents of these students were extremely cooperative and willing to attempt new ideas that might be helpful.

First Week

At the end of the first week of school this writer explained this project to the pupils. At an appropriate moment, after a boisterous outburst, the teacher began a discussion as to the possible basis for the eruption. The idea that different people react to the same circumstances in different ways appeared to be the proper time to introduce

the concept of nutrition, behavior and learning. The class shared some of their eating practices and customs. Most of the boys and girls arrived in the morning with empty stomachs and had always been non-breakfast eaters. The reasons were that there was not enough time, that no one in the family ate breakfast, that there was nothing good to eat, or that the children just did not feel like eating or were not hungry. The few children who did eat breakfast had coffee and/or cereal filled with food coloring and sugar.

In explaining this idea, the students were read the letter that would be sent home explaining this project to the parents (Appendix D:41). A description of what would be studied in the special nutrition classes and what would be prepared in the cooking classes was spelled out to try to gain interest. No one would be included in the special classes who did not agree to four things: 1) eat a nutritious breakfast each morning, 2) limit sugar products, 3) eat more fruits, vegetables, whole-grain and protein-rich foods and 4) complete a nutrition report each week.

Whereas not all of the children would be included in the nutrition and cooking classes, all of the pupils were given the General Nutrition Quiz Pretest and the Wide Range Achievement Test (WRAT), arithmetic sub-test only. On the General Nutrition Quiz Pretest, no one received a perfect

score. The test consisted of ten true/false statements. The average score was 55 percent correct with scores ranging from 90 percent correct to 30 percent correct. On the WRAT, arithmetic subtest, the average score was 34 percent correct responses with scores ranging from 40 percent correct to 22 percent correct.

The students were told that at the conclusion of this study the General Nutrition Posttest and the WRAT would again be administered and the scores of the children who did change eating practices would be compared to the scores of the children who did not change eating habits.

Second Week

At the beginning of the second week of school six of the parent letters had been returned, signed. The parents were immediately contacted by phone and specifics of this project were explained. All were anxious to help the children eliminate negative school behaviors.

In the middle of the second week the first nutrition class was held. All 17 of the pupils were included, but were told that only the six students who returned the parent letter, signed, would be admitted to the first cooking class at the end of the week. Two films were shown - "Nutritional Needs of our Bodies" and "Nutrition: Try it, You'll Like It" - followed by a discussion on the importance of eating a healthy breakfast.

The day after the first nutrition class, also the day before the first cooking class, three more parent letters were returned. The first cooking class took place with only nine children and eight promises from the other boys and girls that the parent letter would come back, signed, by next week. Healthy breakfast foods were sampled and a complete, easy to make breakfast was fixed by the students and eaten. Some of the foods sampled were raisins, cheerios, bagel with cream cheese bites, apple slices and bran muffin bites. The students took turns toasting a piece of whole wheat bread, spreading peanut butter on it and rolling a banana up to resemble a hot dog. Some were reluctant to try it. After tasting it, several of the children wanted another one. All of the students agreed that this was easy to make and tasted good.

Third Week

The third week brought two more parent letters. Only one of them was signed, however. The other letter was signed by the child who wanted to participate in the special classes.

The classroom teacher had the students fill out the Nutrition Reports as a group activity. The boys and girls needed constant reminding. Each morning, after the announcements, the class wrote what they had eaten for breakfast as well as what they had eaten for dinner the night before. The

teacher used this activity as a memory exercise and always had something fun for them to do when the report was written. After lunch, each afternoon, the activity was repeated.

The nutrition class, during the third week, contained an introduction to the basic food groups. The films, "Health: Food and Nutrition", and "You and Your Food", were shown and discussed. A tasting party, to be held at the end of the week, was planned. Each child would bring a nutritious snack to share with the group. Phone calls were made to each parent who was familiarized with the plans and invited to the forthcoming tasting party. Two agreed to assist at the tasting party.

The boys and girls were encouraged to sample at least one bite from each snack. The variety was excellent, as most of the children brought more than one item. The food items shared were: grapes, raisins, peanuts, celery with peanut butter, carrots, yogurt, cheese pieces, whole wheat pretzels, corn chips, garbanzos, tuna, walnuts and granola bars. While these foods were being tasted the film, "You are What You Eat" was viewed. Only a short discussion was held, as it was nearing time to leave. New nutrition reports were passed out and the children were congratulated for the exceptional job of keeping track of the foods eaten.

Fourth Week

The topic for the fourth week was 'snacks'. This week, the nutrition class was held on Monday to encourage nutritious snacking. The films, "Nutritious Snacks and Fast Foods", "Eating on the Run", and "Snacking: Garbage in Your Gut" were all viewed while snacking on popcorn. The movies were talked about and each child was given the assignment of bringing in an original recipe for a healthy snack. The idea of putting together a recipe book of nutritious foods was brought up at this time and enthusiastically accepted.

For the cooking session in week four, each child made an individual pizza, on whole wheat pita bread with tomato sauce and imitation mozzarella cheese. Some were very skeptical, but after tasting the pizza agreed that this recipe should be included in the recipe book. While the pizzas were cooking the boys and girls took turns sharing the original recipe for a nutritious snack that had been assigned. Three of the children forgot the recipe as well as the weekly nutrition report. Telephone calls were made to each parent, by the author, during the weekend. Changes in behavior were noted and plans were made for the parents to view the video, "Do Foods Alter Behavior and Activity?".

The writer met with the teacher of this class to talk about changes in classroom behavior over the last four weeks.

Some of the children were able to sit still for longer periods of time and had improved listening and concentration. It was noted that the children eating breakfast were generally more alert in the morning. Some of the students were now eating breakfast regularly, however, the breakfasts were not healthy.

Fifth Week

Each child, at the beginning of the fifth week, was individually called aside to talk about any concerns or problems. The nutrition reports were reviewed and suggestions were made to improve the diets further. The pupils eating cereals for breakfast containing too much sugar were invited to try other, more nutritious cereals. The children drinking chocolate milk for lunch were encouraged to take only the low fat white milk. Honesty in filling out the weekly nutrition report was carefully explained.

The subject covered during the fifth week was 'sugar'. During the nutrition session, in the middle of the week, the movie, "Sugar Film" was viewed. While watching this very informative movie the boys and girls ate animal crackers that had been sweetened with fruit juice instead of sugar. The concept that fruits had natural sugar was new to most of the group.

The cooking class at the end of the week consisted of half of the group making sugarless oatmeal-raisin cookies,

while the other half made sugarfree, low fat, homemade ice cream. It was unanimously decided to share these with the students who had not agreed to alter eating practices. These recipes would be included in the recipe book.

By this time the writer had met with four of the parents to watch the video, "Do Foods Alter Behavior and Activity?". Five more were planning to see the same video next week.

Sixth Week

The subject for week six was the importance of vitamins and minerals in the diet. The common vitamins and minerals were introduced with some of the foods offering each vitamin or mineral named. Stress was placed on the benefits derived from eating each. Later, while eating raw carrot sticks the movies, "Good Eatin'" and "Food - One, Two, Three, Four", were shown.

At the end of this week the class gathered together to make peanut butter. A great part of this hour was spent shelling roasted peanuts. After blending the peanuts and tasting the homemade peanut butter it was agreed that everyone involved would take home a small jar to share with the family.

Seventh Week

In the seventh week, emphasis was on the value of protein and the many protein sources. Most did not know protein was found in nuts and beans. While eating peanuts,

the films, "Eat Well, Grow Well" and "Eat For Health", were viewed and discussed. It was decided that all would donate to the making of a meatless, protein-rich pot of soup.

The cooking class devoted itself to putting together the soup. While making it, some students decided not to try the soup when it was ready. The soup was imagined to be dreadful although very healthy. Each person was assigned a task. When the ingredients were together, it was explained that soup needed to be cooked for several hours and would be eaten the next day.

In the morning the soup was brought in and warmed on a hot plate in the classroom. It smelled so good, even those that had no intention of trying the soup were anxious to sample it. Because this classroom is next to the office, anyone entering the office was able to smell the soup. By the end of the day all of the teachers, several volunteers and many visitors had asked for a sample of the soup. The compliments received by the children encouraged some of those who had not agreed to change eating habits to ask this author if it was too late to be included in the special classes. This was one of the most positive experiences of this study.

Eighth Week

The following week was devoted to reading food labels for nutrition information and ingredients. Many food labels were brought in and classified into groups. The labels from

similar foods made by different companies were compared. Many were surprised to find so many differences and equally amazed at the amount of information on a label. Some were reading labels for the first time.

The next meeting was spent watching the films, "Food For Fun" and "Eating Right With Harv and Marv".

Ninth Week

The topic for the next week was 'junk food'. It was agreed that junk food was food that had no value. Each member of the group made a list of useless foods eaten since school began and another list of foods surrendered since the project first started. Some admitted that these foods had not been given up completely but were eaten less often.

At the end of the week, "The Junk Food Man" and "Junk Food Film", were viewed and talked about. Halloween had good timing this year, as it happened to fall two days before this session. After seeing the movies one of the students was curious about a recent morning headache. This opened a valuable discussion pertaining to personal experiences after eating too much Halloween candy. One mentioned having difficulty sleeping. Another observed that it was hard to concentrate in school.

After talking with the parents of these children it was discovered that they, too, had learned a lot. Some had been saying that there was not much of a behavior change until

post-Halloween. Only then did they realize that yes, there had been a genuine change. All were invited to share in a healthy foods luncheon the following week.

Tenth Week

The tenth week consisted of three planning meetings for the healthy foods luncheon. It was decided that the group would again prepare soup and each person would be responsible for bringing a dish to share.

The 17 students previously pretested were given the General Nutrition Quiz Posttest and the WRAT, arithmetic subtest, once more. Scores of the students who did change eating practices were compared to the scores of those who did not change. On the General Nutrition Quiz posttest, nine of the ten children involved in the special nutrition classes received perfect scores. One child missed one item, of ten. Of the pupils not attending the nutrition classes no one obtained a perfect score. The average score was 60 percent correct responses, with scores ranging from 40 percent correct to 80 percent correct. The WRAT, produced similar results. The students attending nutrition classes improved scores from six percent to up to twelve percent. The pupils not in attendance improved scores from not at all, to six percent.

Each Friday these children returned to this writer a nutrition report. In the beginning the reports were not

always complete. Sometimes the information showed very little change in eating habits. As more knowledge was gained the nutrition reports showed bigger changes.

Weekly conferences were held between this writer and the teacher of the class to discuss each child. In the beginning only minor improvements were noted. Later in the project the cooperating students displayed longer attention spans and were completing tasks more frequently than those who had not altered eating patterns.

CHAPTER IV

RESULTS

Evaluation for this practicum was threefold. Weekly evaluations were conducted throughout this project scoring observed behaviors on a chart. At the end of ten weeks the charts showed that 50 percent of these children had improved school behavior and were enjoying more academic success, such as completing tasks, remembering, comprehending materials and improving self-esteem (See Appendix A:35.). Results were not drastic but were noticeable enough for the principal of this institution to observe.

To help show improved academic success, the Wide Range Achievement Test (WRAT) was given during the first week of this study to all of the students enrolled in this self-contained class of "at risk" children. The same test was given at the conclusion of this practicum, and the scores of the children who did not alter eating habits were compared to the scores of the children who did change eating practices and the results, as shown on Table 1, demonstrated the success of this project.

Table 1
A Comparison of Wide Range Achievement Test Scores
Between Children Who Altered Eating Practices
and Children Who Did Not

<u>Student #</u>	<u>Pretest Score**</u>	<u>Posttest Score</u>
1*	40	48
2*	40	46
3*	38	44
4*	36	42
5*	36	46
6*	34	44
7*	34	42
8*	32	42
9*	30	38
10*	28	40
11	38	40
12	38	44
13	34	40
14	32	36
15	30	32
16	28	28
17	22	28

* Altered Eating Practices

** Percent Correct

All of the children included in this study learned the value of proper nutrition. This was evaluated with a General Nutrition Quiz pretest and posttest. Scores were compared to show the mastery of proper nutrition concepts, by 100 percent of the students attending the nutrition education and cooking classes, as shown on Table 2.

Table 2

A Comparison of General Nutrition Quiz Scores Between
Children Who Altered Eating Practices
and Children Who Did Not

<u>Student #</u>	<u>Pretest Score**</u>	<u>Posttest Score</u>
1*	9	10
2*	7	10
3*	7	10
4*	7	10
5*	6	10
6*	6	10
7*	5	10
8*	5	10
9*	4	10
10*	3	9
11	4	6
12	8	8
13	3	4
14	7	8
15	3	5
16	6	7
17	5	5

* Altered Eating Practices

** Number Correct

This project indeed demonstrated that eating practices
had an effect on learning.

CHAPTER V

RECOMMENDATIONS

This writer believes that this study was only the beginning of an ongoing project to improve the nutritional practices of all the children attending the school where this project took place. Parents of boys and girls not involved in the study have requested to view the video, "Do Foods Alter Behavior and Activity?". Other teachers have begun an in-depth unit on nutrition and healthful foods that include watching the films previously named in the method chapter of this practicum.

Before this project started, the Parent-Teacher Association (P.T.A.) was familiarized with the plan. The P.T.A. agreed to encourage improved nutritional practices, if favorable results followed, at one of the monthly meetings. Before the conclusion of the study, plans were made to include proper nutrition guidelines in the monthly newsletter reproduced and sent home with each child. Plans were also made to include, at the next general meeting, the findings of this practicum.

The findings disclosed in this project will be shared with the Department of Food Services for the public school

system. Schauss (1980) reported that delinquency and vandalism diminished, in schools, while scholastic ability increased, when school lunch programs and home diets were made more nutritious.

The public school system has a Nutrition Task Force that this writer consulted. The findings of this study will be shared with them as requested.

Reference List

- Benton, D. "Effect of Vitamin and Mineral Supplementation on Intelligence of a Sample of Schoolchildren." The Lancet. 1988, pp. 140-143.
- Boehnlein, Mary. "Parents and Nutrition." May 8, 1984. ERIC ED 250 074.
- Bucholtz, Piedad. "Village Green Report of School Progress." 1989-1990.
- Charlton-Seifert, Strattan and Williams. "Sweet and Slow: Diet Can Affect Learning." Academic Therapy. November, 1980, pp. 211-217.
- Clark, R.M. Nutrition and Learning. Clearing House, 55, pp. 300-304.
- Goldman, J.A., et. al. "Behavioral Effects of Sucrose on Preschool Children." Journal of Abnormal Child Psychology. 1986, 14, pp. 565-578.
- Honig, Alice. "Risk Factors in Infants and Young Children." Young Children. May, 1984, pp. 60-72.
- Krassner, M. B. "Diet and Brain Function." Nutrition Reviews (Supplement). May, 1986, pp. 12-15.
- Lane and Johnson. "Prevalence of Iron Deficiency." In Report of the Eighty-Second Ross Conference on Pediatric Research. Columbus, Ohio: Ross Laboratories, 1981.
- Lozoff, B., et. al. "Developmental Deficits in Iron - Deficient Infants: Effects of Age and Severity of Iron Lack." Journal of Pediatrics, 1982, pp. 948-952.
- Milius, S. "Learning to Love Breakfast." Organic Gardening. October, 1983, pp. 90-93.
- Norwood, G. R. "The Relationship of Health and Nutrition to the Learning Process." June, 1984. ERIC ED 248 955.
- Pereira, et. al. "What is the Relationship Between Nutrition and Learning?" Paper presented at the Annual Reading Conference, New York, New York, January, 1982.

- Pertz and Putnam. "What is the Relationship Between Nutrition and Learning?" January 8, 1982. ERIC ED 220 797.
- Prinz, Roberts and Hantman. "Sugar Consumption and Hyperactivity in Young Children." Journal of Consulting and Clinical Psychology. 1989, 48, pp. 760-769.
- Rapp, Doris, R.N., FAAA, FAAP. The Impossible Child. Washington: Life Sciences Press, 1986.
- Reed, B. Food, Teens and Behavior. Manitowoc: Natural Press, 1983.
- Schauss, A. Diet, Crime and Delinquency. Berkeley: Parker House, 1980.
- Stein, Foucar - Szock, Kauffman. "Nutrition and Learning: The Breakfast Role." February 4, 1984. ERIC ED 241 463.

APPENDIX A
OBSERVATION OF STUDENT BEHAVIORS

Date _____

	<u>0%</u>	<u>1-10%</u>	<u>11-30%</u>	<u>31-50%</u>	<u>Over 50%</u>
Seems to have difficulty	_____	_____	_____	_____	_____
staying in seat	_____	_____	_____	_____	_____
Does not complete tasks	_____	_____	_____	_____	_____
Has short attention span	_____	_____	_____	_____	_____
Appears to daydream	_____	_____	_____	_____	_____
Appears nervous, jumpy	_____	_____	_____	_____	_____
Retains oral directions	_____	_____	_____	_____	_____
Comprehends materials	_____	_____	_____	_____	_____
read	_____	_____	_____	_____	_____
Comments	_____				

0% = Never
 1-10% = Seldom
 11-30% = Sometimes
 31-50% = Often
 Over 50% = Excessively

APPENDIX B
NUTRITION REPORT

Fri. Sat. Sun. Mon. Tues. Wed. Thurs.

Ate a nutritious
breakfast

Ate breakfast, but
not a nutritious
one

Ate no breakfast
today

Fruits and vegg.
eaten today:

These are the
sugar foods eaten
today:

I was invited to a party (or parties) this week and ate the
following sugar and junk foods: _____

Date

Please sign & return on Friday

Appendix C
General Nutrition Quiz
Pretest/Posttest

- T F 1. Breakfast is not necessary if you get a good night's sleep.
- T F 2. Every time your stomach growls you are hungry.
- T F 3. Breakfast can be nutritious and delicious. It does not need to taste bad to be healthy.
- T F 4. Snacks should be avoided.
- T F 5. Sugar is necessary for suitable energy.
- T F 6. Protein can only be found in meat (beef, chicken, fish, pork).
- T F 7. Iron is necessary only for infants and very old people.
- T F 8. Calcium is abundant in raisins.
- T F 9. Even when we sleep our bodies use energy.
- T F 10. A person can be sure he/she is getting all the necessary nutrients only by taking vitamin pills.

APPENDIX D
LETTER TO PARENTS

Dear

I would like to involve you and _____ in a study that sincerely interests me. I would also like to help _____ gain more academic successes.

This summer I read many studies that have been carried out connecting improved nutrition and the ability to learn and remember. Improved nutrition has also been connected with better behavior.

Wouldn't it be wonderful if just a few dietary changes helped _____ learn more easily, concentrate better, sit still longer and remember what you tell him/her? With better nutrition _____ will enjoy all-around better health, too.

I will work very closely with you over the next three months and will need your kind cooperation.

In order to accomplish my project, it is imperative that you agree to several things:

- 1) limit (at least greatly reduce) sugar products
- 2) provide a nutritious breakfast each morning
- 3) provide more fruits, vegetables, whole-grain and protein-rich foods
- 4) provide only nutritious snacks - no more junk food!
- 5) I will also ask that you fill out a brief checklist each week.

Over the next several months you will be receiving newsletters filled with ideas, recipes and inspirational facts. Your thoughts and ideas will certainly be welcome. Classes will also be provided for cooking, learning about nutrition and tasting delicious, nutritious foods.

Please sign and return this if you would care to participate. I look forward to working with you and know that we will have a most enjoyable adventure.

Very sincerely,

Marjorie Swensson

____ Yes, I am interested in working with you and improving my child's nutritional practices. My home phone number is _____. My phone number at work is _____. The best time to reach me is _____.